

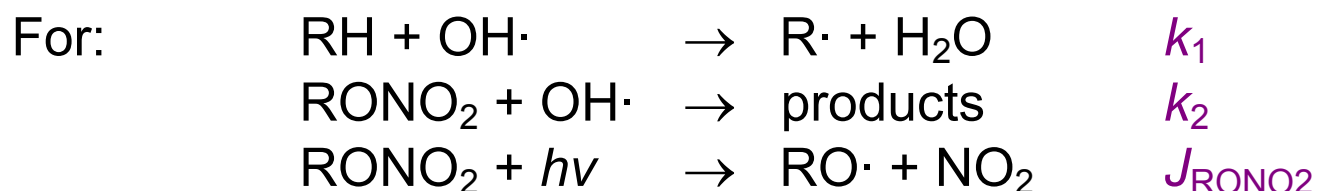
Photochemical Alkyl Nitrate Production

For two daughter alkyl nitrates a and b that originate from the same parent hydrocarbon ($\geq C_5$) [*Flocke et al.*, 1998]:

$$\frac{[\text{RONO}_2]_a}{[\text{RONO}_2]_b} = \frac{(\alpha_1\alpha_2)_a}{(\alpha_1\alpha_2)_b}$$

- ❖ $[\text{RONO}_2]_a / [\text{RONO}_2]_b$: TRACE-P msts.
- ❖ α_1, α_2 :
 - Atkinson* [1987]
 - Atkinson et al.* [1987]
 - Kwok and Atkinson* [1995]
 - Arey et al.* [2001]

Alkyl Nitrate Evolution



where:

$$k_A = k_1 [\text{OH}]$$

$$k_B = k_2 [\text{OH}] + J_{\text{RONO}_2}$$

Evolution of alkyl nitrates in an air mass
[*Bertman et al.*, 1995]:

$$\frac{[\text{RONO}_2]}{[\text{RH}]} = \frac{\alpha_1 \alpha_2 k_A}{(k_B - k_A)} \left(1 - e^{(k_A - k_B)t} \right)$$

↓
TRACE-P msts.

↓
 α_1, α_2 : *Atkinson* [1987]

Atkinson et al. [1987]

Kwok and Atkinson [1995]

Arey et al. [2001]

J_{RONO_2} : *J. Crawford* [pers. comm.]

$[\text{OH}]$: *from the Eisele group*

Conclusions

1. **7 C₁-C₅ alkyl nitrates** measured in whole air samples during TRACE-P (DC-8 & P3-B)
2. anticipate **2 alkyl nitrate papers**:
(1) distribution; (2) kinetics
3. **photochemical cn. marine** alkyl nitrate production evident
4. **production and evolution** curves using **field** measurements are being compared with predicted curves using **laboratory** kinetic data

